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CATTOLI, Giovanni

<120> HELICOBACTER FELIS VACCINES

<130> KUSTERS

<140> 09/904,994

<141> 2001-07-13

<150> EP00202565.8

<151> 2000-07-17

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Gly	Glu	Val	Ala	Arg	Lys	Arg	Lys	Ala	Glu	Gly	Leu	Lys	Leu	Asn	Gln	
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Pro	Glu	Ala	Ile	Ala	Tyr	Ile	Ser	Ala	His	Ile	Met	Asp	Glu	Ala	Arg	
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Glu	Leu	Glu	Val	Thr	Asn	Glu	Gly	Pro	Lys	Ser	Leu	His	Val	Gly	Ser	
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Lys	Ala	Tyr	Gly	Lys	Arg	Leu	Asp	Ile	Pro	Ser	Gly	Asn	Thr	Leu	Arg	
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 Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp
 65 70 75 80
 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val
 85 90 95
 Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys
 100 105 110
 Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr
 115 120 125
 Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser
 130 135 140
 His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu
 145 150 155 160
 Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg
 165 170 175
 Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly
 180 185 190
 Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp
 195 200 205
 Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe
 210 215 220

Ile Lys
225

<210> 6
<211> 568
<212> PRT
<213> Helicobacter felis

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Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu
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His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys
35 40 45
Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr
50 55 60
Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile
65 70 75 80
Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly
85 90 95
Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val
100 105 110
Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr
115 120 125
Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe
130 135 140
Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr
145 150 155 160
Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp
165 170 175
Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val
180 185 190
Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu
195 200 205
Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly
210 215 220
Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr
225 230 235 240
Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr
245 250 255
Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr
260 265 270
His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met
275 280 285
Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro
290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys																	
305					310				315								320
His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser																	
				325				330									335
Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile																	
			340					345									350
Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala																	
			355					360									365
Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys																	
			370					375									380
Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp Asn Phe Arg																	
385					390				395								400
Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His																	
				405					410								415
Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp																	
			420					425									430
Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val																	
			435					440									445
Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala																	
			450					455									460
Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His																	
465					470				475								480
His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val																	
				485					490								495
Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Lys Val																	
			500					505									510
Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe																	
			515					520									525
Asn Asn Lys Thr Ala His Ile Thr Val Asp Pro Lys Thr Phe Glu Val																	
			530					535									540
Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Ala Ser Glu Val Pro																	
545					550				555								560
Leu Ala Gln Arg Tyr Thr Phe Phe																	
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<210> 7

<211> 2183

<212> DNA

<213> Helicobacter felis

<220>

<221> CDS

<222> (3)..(683)

<220>

<221> CDS

<222> (694)..(2181)

<400> 7

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gcg ggc gaa gtg gct aga aag cgc aaa gca gag ggc tta aag ctc aat	95
Ala Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn	
20 25 30	
caa ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg	143
Gln Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala	
35 40 45	
cgc cgt ggc aaa aaa acc gtt gct gaa ctt atg gaa gaa tgt atg cac	191
Arg Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His	
50 55 60	
ttt ttg aaa aaa gat gag gtg atg ccc ggt gtg ggg aat atg gtc cct	239
Phe Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro	
65 70 75	
gat ttg ggc gta gaa gcc act ttc ccc gat ggc acc aaa ctc gta acc	287
Asp Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr	
80 85 90 95	
gtg aat tgg ccc att gaa cct gat gaa cac ttt aaa gcc ggt gaa gtg	335
Val Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val	
100 105 110	
aaa ttt ggc tgt gat aaa gac att gag ctc aac gtg ggt aag gaa gtt	383
Lys Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Val Gly Lys Glu Val	
115 120 125	
acc gag ctt gaa gtt acc aac gaa gga cct aaa tcc ttg cat gtg ggt	431
Thr Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly	
130 135 140	
agc cat ttc cac ttc ttt gaa acc aac aag gca ttg aaa ttc gat cgg	479
Ser His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg	
145 150 155	
gaa aaa gcc tat ggc aaa cgc cta gat att ccc tct ggc aac acg cta	527
Glu Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu	
160 165 170 175	
cgc att ggg gca gga caa acc cgt aaa gtg cag tta atc cct ctt ggc	575

Arg Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly	
180 185 190	
ggt agt aaa aaa gtg att ggc atg aac ggg ctt gtg aat aat att gcg	623
Gly Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala	
195 200 205	
gac gaa cgc cat aaa cac aaa gca cta gac aag gca aaa tct cac gga	671
Asp Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly	
210 215 220	
ttc atc aag taa ggagactccc atg aaa atg aaa aaa caa gag tat gta	720
Phe Ile Lys Met Lys Met Lys Lys Gln Glu Tyr Val	
225 230 235	
aac acc tac gga ccc acc aca ggc gat aaa gtg cgc tta gga gat acc	768
Asn Thr Tyr Gly Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr	
240 245 250	
gat ctt tgg gca gaa gta gaa cat gac tat acc act tat ggc gaa gag	816
Asp Leu Trp Ala Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu	
255 260 265	
ctc aaa ttt ggc gcg ggt aaa act atc cgt gag ggt atg ggt cag agc	864
Leu Lys Phe Gly Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser	
270 275 280	
aat agc cca gat gaa aac acc tta gat tta gtg atc acc aac gcg atg	912
Asn Ser Pro Asp Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met	
285 290 295 300	
att atc gac tac acc ggg att tat aaa gcc gac att ggt att aaa aat	960
Ile Ile Asp Tyr Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn	
305 310 315	
ggc aaa atc cat ggt att ggc aag gcg ggg aac aaa gac atg caa gat	1008
Gly Lys Ile His Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp	
320 325 330	
ggc gta agc cct cat atg gtc gtg ggt gtg ggc aca gaa gca cta gca	1056
Gly Val Ser Pro His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala	
335 340 345	
ggg gaa ggt atg att att acc gct ggg ggg atc gat tcg cac acc cac	1104
Gly Glu Gly Met Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His	
350 355 360	
ttc ctc tct ccc caa caa ttc cct acc gct cta gcc aat ggt gtt aca	1152

Phe Leu Ser Pro Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr	
365	370 375 380
acc atg ttt gga ggt ggc aca ggt ccg gta gat ggc acg aat gcg acc	1200
Thr Met Phe Gly Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr	
	385 390 395
acc atc act ccg ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gct	1248
Thr Ile Thr Pro Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala	
	400 405 410
gaa gag tat tct atg aat gta ggc ttt ttg ggc aaa ggc aat agt tct	1296
Glu Glu Tyr Ser Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser	
	415 420 425
agc aaa aaa caa ctt gta gaa caa gta gaa gcg ggc gcg att ggc ttt	1344
Ser Lys Lys Gln Leu Val Glu Gln Val Glu Ala Gly Ala Ile Gly Phe	
	430 435 440
aaa ttg cat gaa gac tgg ggc aca aca cca agt gcg atc gat cac tgc	1392
Lys Leu His Glu Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys	
	445 450 455 460
ttg agc gtg gca gat gaa tac gat gtg caa gtt tgt atc cac acc gat	1440
Leu Ser Val Ala Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp	
	465 470 475
acg gtc aat gag gca ggt tat gtg gat gac acc cta aat gca atg aac	1488
Thr Val Asn Glu Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn	
	480 485 490
ggg cgc gcc atc cat gcc tac cac att gag gga gcg ggc gga gga cac	1536
Gly Arg Ala Ile His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His	
	495 500 505
tca cct gat gtt atc acc atg gca ggc gag ctc aat att cta ccc tcc	1584
Ser Pro Asp Val Ile Thr Met Ala Gly Glu Leu Asn Ile Leu Pro Ser	
	510 515 520
tcc acc acc ccc act att ccc tat acc att aat acg gtt gca gaa cac	1632
Ser Thr Thr Pro Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His	
	525 530 535 540
tta gac atg ctc atg acc tgc cac cac cta gat aag cgc atc cgc gag	1680
Leu Asp Met Leu Met Thr Cys His His Leu Asp Lys Arg Ile Arg Glu	
	545 550 555
gat tta caa ttt tct caa agc cgt atc cgc ccc gga tct att gcc gct	1728

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Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala
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Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln
20 25 30
Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg
35 40 45
Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe
50 55 60
Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp
65 70 75 80
Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val
85 90 95
Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys
100 105 110
Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Val Gly Lys Glu Val Thr
115 120 125
Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser
130 135 140
His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu
145 150 155 160
Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg
165 170 175
Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly
180 185 190
Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp
195 200 205
Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe
210 215 220
Ile Lys
225

<210> 9

<211> 496

<212> PRT

<213> *Helicobacter felis*

<400> 9

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20 25 30
His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys
35 40 45
Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr
50 55 60

Leu	Asp	Leu	Val	Ile	Thr	Asn	Ala	Met	Ile	Ile	Asp	Tyr	Thr	Gly	Ile
65					70					75					80
Tyr	Lys	Ala	Asp	Ile	Gly	Ile	Lys	Asn	Gly	Lys	Ile	His	Gly	Ile	Gly
				85					90					95	
Lys	Ala	Gly	Asn	Lys	Asp	Met	Gln	Asp	Gly	Val	Ser	Pro	His	Met	Val
			100					105					110		
Val	Gly	Val	Gly	Thr	Glu	Ala	Leu	Ala	Gly	Glu	Gly	Met	Ile	Ile	Thr
		115					120					125			
Ala	Gly	Gly	Ile	Asp	Ser	His	Thr	His	Phe	Leu	Ser	Pro	Gln	Gln	Phe
	130					135					140				
Pro	Thr	Ala	Leu	Ala	Asn	Gly	Val	Thr	Thr	Met	Phe	Gly	Gly	Gly	Thr
145					150					155					160
Gly	Pro	Val	Asp	Gly	Thr	Asn	Ala	Thr	Thr	Ile	Thr	Pro	Gly	Lys	Trp
			165						170					175	
Asn	Leu	His	Arg	Met	Leu	Arg	Ala	Ala	Glu	Glu	Tyr	Ser	Met	Asn	Val
			180					185					190		
Gly	Phe	Leu	Gly	Lys	Gly	Asn	Ser	Ser	Ser	Lys	Lys	Gln	Leu	Val	Glu
	195					200						205			
Gln	Val	Glu	Ala	Gly	Ala	Ile	Gly	Phe	Lys	Leu	His	Glu	Asp	Trp	Gly
	210					215					220				
Thr	Thr	Pro	Ser	Ala	Ile	Asp	His	Cys	Leu	Ser	Val	Ala	Asp	Glu	Tyr
225					230					235					240
Asp	Val	Gln	Val	Cys	Ile	His	Thr	Asp	Thr	Val	Asn	Glu	Ala	Gly	Tyr
			245						250					255	
Val	Asp	Asp	Thr	Leu	Asn	Ala	Met	Asn	Gly	Arg	Ala	Ile	His	Ala	Tyr
			260					265					270		
His	Ile	Glu	Gly	Ala	Gly	Gly	Gly	His	Ser	Pro	Asp	Val	Ile	Thr	Met
	275						280					285			
Ala	Gly	Glu	Leu	Asn	Ile	Leu	Pro	Ser	Ser	Thr	Thr	Pro	Thr	Ile	Pro
	290					295					300				
Tyr	Thr	Ile	Asn	Thr	Val	Ala	Glu	His	Leu	Asp	Met	Leu	Met	Thr	Cys
305				310					315						320
His	His	Leu	Asp	Lys	Arg	Ile	Arg	Glu	Asp	Leu	Gln	Phe	Ser	Gln	Ser
			325						330					335	
Arg	Ile	Arg	Pro	Gly	Ser	Ile	Ala	Ala	Glu	Asp	Val	Leu	His	Asp	Ile
			340					345					350		
Gly	Val	Ile	Ala	Met	Thr	Ser	Ser	Asp	Ser	Gln	Ala	Met	Gly	Arg	Ala
	355						360					365			
Gly	Glu	Val	Ile	Pro	Arg	Thr	Trp	Gln	Thr	Ala	Asp	Lys	Asn	Lys	Lys
	370					375				380					
Glu	Phe	Gly	Lys	Leu	Pro	Glu	Asp	Gly	Ala	Asp	Asn	Asp	Asn	Phe	Arg
385				390					395						400
Ile	Lys	Arg	Tyr	Ile	Ser	Lys	Tyr	Thr	Ile	Asn	Pro	Ala	Leu	Thr	His
			405						410					415	
Gly	Val	Ser	Glu	Tyr	Ile	Gly	Ser	Val	Glu	Glu	Gly	Lys	Ile	Ala	Asp
		420						425				430			
Leu	Val	Val	Trp	Asn	Pro	Ala	Phe	Phe	Gly	Val	Lys	Pro	Lys	Ile	Val
	435						440					445			

Ile	Lys	Gly	Gly	Met	Val	Val	Phe	Ser	Glu	Met	Gly	Asp	Ser	Asn	Ala
450						455					460				
Ser	Val	Pro	Thr	Pro	Gln	Pro	Val	Tyr	Tyr	Arg	Glu	Met	Phe	Gly	His
465					470					475					480
His	Gly	Lys	Ala	Lys	Phe	Asp	Thr	Ser	Ile	Thr	Phe	Arg	Val	Ser	Ser
				485					490					495	

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 <211> 2407
 <212> DNA
 <213> Helicobacter felis

<220>
 <221> CDS
 <222> (2)..(682)

<220>
 <221> CDS
 <222> (693)..(2399)

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 Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala
 1 5 10 15

ggc gaa gtg gct aga aag cgc aaa gcg gag ggc tta aag ctc aac caa 97
 Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln
 20 25 30

ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg cgc 145
 Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg
 35 40 45

cgt ggc aaa aag acc gtt gcg gaa ctt atg gaa gag tgt atg cac ttt 193
 Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe
 50 55 60

ttg aaa aaa gac gag gtg atg ccc ggt gtg ggg aat atg gtc cct gat 241
 Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp
 65 70 75 80

tta ggc gtg gaa gct act ttt ccc gat ggc acc aaa ctc gta acc gtg 289
 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val
 85 90 95

aat tgg ccc atc gaa ccc gat gaa cac ttc aaa gcg ggc gaa gtc aaa 337

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys	
100 105 110	
ttt ggc tgt gat aaa gac att gaa ctc aac gca ggt aag gaa gtt acc	385
Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr	
115 120 125	
gaa cta gaa gtt acc aac gaa gga cct aaa tcc ttg cat gtg ggt agc	433
Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser	
130 135 140	
cat ttc cac ttc ttt gaa gcc aac aag gca ttg aaa ttc gat cgg gaa	481
His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu	
145 150 155 160	
aaa gcc tat ggc aaa cgc cta gat att ccc tct ggc aac acg cta cgc	529
Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg	
165 170 175	
att ggg gca gga caa acc cgt aaa gtg cag tta atc cct ctt ggc ggc	577
Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly	
180 185 190	
agt aaa aaa gtg att ggc atg aac ggg ctt gtg aat aat att gca gat	625
Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp	
195 200 205	
gaa cgc cat aaa cac aaa gcg tta gaa aaa gca aaa tct cac gga ttt	673
Glu Arg His Lys His Lys Ala Leu Glu Lys Ala Lys Ser His Gly Phe	
210 215 220	
atc aaa taa ggagactccc atg aaa atg aaa aaa caa gag tat gta aat	722
Ile Lys Met Lys Met Lys Lys Gln Glu Tyr Val Asn	
225 230 235	
acc tac gga cct acc aca ggc gac aaa gtg cgc tta gga gat acc gat	770
Thr Tyr Gly Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr Asp	
240 245 250	
ctt tgg gca gaa gta gaa cat gac tat acc act tat ggc gaa gag ctc	818
Leu Trp Ala Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu	
255 260 265	
aaa ttt ggc gcg ggt aaa act atc cgt gag ggc atg ggt cag agc aat	866
Lys Phe Gly Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser Asn	
270 275 280 285	
agt cca gat gaa aac acc cta gat tta gtc atc acc aac gcg atg att	914

Ser Pro Asp Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met Ile	
290	295 300
att gac tac acc ggg att tac aaa gcc gac att ggc att aaa aat ggc	962
Ile Asp Tyr Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly	
305 310 315	
aaa atc cat ggc att ggc aag gca gga aac aag gac atg caa gat ggc	1010
Lys Ile His Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp Gly	
320 325 330	
gta agc cct cat atg gtc gtg ggt gtg ggc aca gaa gca tta gca ggc	1058
Val Ser Pro His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala Gly	
335 340 345	
gaa ggt atg att att acc gct ggg ggg atc gat tca cac acc cac ttc	1106
Glu Gly Met Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His Phe	
350 355 360 365	
ctc tct cca caa caa ttc cct acc gct cta gcc aat ggc gtt aca acc	1154
Leu Ser Pro Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr Thr	
370 375 380	
atg ttt ggc ggt ggc aca ggt ccg gta gat ggc acg aat gcg act acc	1202
Met Phe Gly Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr Thr	
385 390 395	
atc act ccg ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gct gaa	1250
Ile Thr Pro Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala Glu	
400 405 410	
gag tat tct atg aat gtg ggc ttt ttg ggc aaa ggc aat agc tcc agt	1298
Glu Tyr Ser Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser	
415 420 425	
aaa aaa caa ctt gta gaa caa atg caa gcg ggc gcg atc ggc ttt aaa	1346
Lys Lys Gln Leu Val Glu Gln Met Gln Ala Gly Ala Ile Gly Phe Lys	
430 435 440 445	
ttg cat gaa gac tgg ggc aca act cca agt gca atc gat cac tgc ttg	1394
Leu His Glu Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys Leu	
450 455 460	
agc gta gca gat gaa tac gat gtg caa gtt tgt atc cac acc gat acg	1442
Ser Val Ala Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp Thr	
465 470 475	
gtc aat gag gca ggt tat gta gat gac acc ctg aat gcg atg aac ggc	1490

Val Asn Glu Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn Gly	
480	485 490
cgc gcc atc cat gcc tac cac att gag gga gcg ggc gga gga cac tca	1538
Arg Ala Ile His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His Ser	
495 500 505	
cct gat gtt atc acc atg gca ggc gag ctc aat att cta ccc tcc tcc	1586
Pro Asp Val Ile Thr Met Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser	
510 515 520 525	
aca acc ccc act atc ccc tat acc att aat acg gtt gca gaa cac tta	1634
Thr Thr Pro Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His Leu	
530 535 540	
gac atg ctc atg acc tgc cac cac cta gat aaa cgc atc cgc gag gat	1682
Asp Met Leu Met Thr Cys His His Leu Asp Lys Arg Ile Arg Glu Asp	
545 550 555	
tta caa ttt tcc caa agc cgt atc cgc ccc ggc tct atc gcc gct gaa	1730
Leu Gln Phe Ser Gln Ser Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu	
560 565 570	
gat gtg ctc cat gat att ggc gtg atc gcg atg aca agc tcg gat tcg	1778
Asp Val Leu His Asp Ile Gly Val Ile Ala Met Thr Ser Ser Asp Ser	
575 580 585	
caa gca atg ggg cgc gct ggc gaa gtg att cct cga act tgg cag act	1826
Gln Ala Met Gly Arg Ala Gly Glu Val Ile Pro Arg Thr Trp Gln Thr	
590 595 600 605	
gcg gat aag aat aaa aaa gaa ttt ggt aag ctt cct gaa gat agt gca	1874
Ala Asp Lys Asn Lys Lys Glu Phe Gly Lys Leu Pro Glu Asp Ser Ala	
610 615 620	
gat aac gac aac ttc cgt atc aaa cgc tac atc tcc aaa tac act att	1922
Asp Asn Asp Asn Phe Arg Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile	
625 630 635	
aac ccc gct cta acc cat ggg gta agc gag tat atc ggc tct gtg gaa	1970
Asn Pro Ala Leu Thr His Gly Val Ser Glu Tyr Ile Gly Ser Val Glu	
640 645 650	
gag ggc aaa atc gct gat ttg gtg gtg tgg aat cct gcc ttt ttt ggt	2018
Glu Gly Lys Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe Gly	
655 660 665	
gtg aaa cct aag att gtg atc aaa ggc ggt atg gtg gtc ttc tct gaa	2066

Val	Lys	Pro	Lys	Ile	Val	Ile	Lys	Gly	Gly	Met	Val	Val	Phe	Ser	Glu
670					675					680					685
atg ggc gac tcc aac gcg tcc gtg cct aca cct cag ccg gtt tat tac	2114														
Met Gly Asp Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr															
	690								695					700	
cgc gaa atg ttt ggg cat cac gcc aag gcg aaa ttt gac acc agc atc	2162														
Arg Glu Met Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Ile															
	705							710				715			
act ttt gtt tcc aaa gtc gcc tat gaa aat gcc gtg aaa gaa aaa cta	2210														
Thr Phe Val Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu															
	720						725					730			
ggc tta gag cgc aag gtg cta ccc gtg aaa aac tgc cgc aac atc act	2258														
Gly Leu Glu Arg Lys Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr															
	735					740					745				
aag aaa gac ttc aaa ttc aac aac aag acg gcg cat atc act gtc gat	2306														
Lys Lys Asp Phe Lys Phe Asn Asn Lys Thr Ala His Ile Thr Val Asp															
750					755					760					765
cct aaa acc ttc gag gtc ttt gta gat gcc aaa ctg tgc acc tct aaa	2354														
Pro Lys Thr Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Lys															
	770							775					780		
ccc gcc tct gaa gtg cct cta gcc cag cgc tac act ttc ttc tag	2399														
Pro Ala Ser Glu Val Pro Leu Ala Gln Arg Tyr Thr Phe Fhe															
	785							790				795			
gcncaatg	2407														

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp
 65 70 75 80
 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val
 85 90 95
 Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys
 100 105 110
 Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr
 115 120 125
 Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser
 130 135 140
 His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu
 145 150 155 160
 Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg
 165 170 175
 Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly
 180 185 190
 Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp
 195 200 205
 Glu Arg His Lys His Lys Ala Leu Glu Lys Ala Lys Ser His Gly Phe
 210 215 220
 Ile Lys
 225

<210> 12
 <211> 568
 <212> PRT
 <213> *Helicobacter felis*

<400> 12
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 Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu
 20 25 30
 His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys
 35 40 45
 Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr
 50 55 60
 Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile
 65 70 75 80
 Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly
 85 90 95
 Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val
 100 105 110
 Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr
 115 120 125
 Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe
 130 135 140

Pro	Thr	Ala	Leu	Ala	Asn	Gly	Val	Thr	Thr	Met	Phe	Gly	Gly	Gly	Thr
145					150					155					160
Gly	Pro	Val	Asp	Gly	Thr	Asn	Ala	Thr	Thr	Ile	Thr	Pro	Gly	Lys	Trp
			165						170					175	
Asn	Leu	His	Arg	Met	Leu	Arg	Ala	Ala	Glu	Glu	Tyr	Ser	Met	Asn	Val
			180					185					190		
Gly	Phe	Leu	Gly	Lys	Gly	Asn	Ser	Ser	Ser	Lys	Lys	Gln	Leu	Val	Glu
		195					200					205			
Gln	Met	Gln	Ala	Gly	Ala	Ile	Gly	Phe	Lys	Leu	His	Glu	Asp	Trp	Gly
	210					215					220				
Thr	Thr	Pro	Ser	Ala	Ile	Asp	His	Cys	Leu	Ser	Val	Ala	Asp	Glu	Tyr
225					230					235					240
Asp	Val	Gln	Val	Cys	Ile	His	Thr	Asp	Thr	Val	Asn	Glu	Ala	Gly	Tyr
				245					250					255	
Val	Asp	Asp	Thr	Leu	Asn	Ala	Met	Asn	Gly	Arg	Ala	Ile	His	Ala	Tyr
			260					265					270		
His	Ile	Glu	Gly	Ala	Gly	Gly	Gly	His	Ser	Pro	Asp	Val	Ile	Thr	Met
		275					280					285			
Ala	Gly	Glu	Leu	Asn	Ile	Leu	Pro	Ser	Ser	Thr	Thr	Pro	Thr	Ile	Pro
	290					295						300			
Tyr	Thr	Ile	Asn	Thr	Val	Ala	Glu	His	Leu	Asp	Met	Leu	Met	Thr	Cys
305					310					315					320
His	His	Leu	Asp	Lys	Arg	Ile	Arg	Glu	Asp	Leu	Gln	Phe	Ser	Gln	Ser
				325					330					335	
Arg	Ile	Arg	Pro	Gly	Ser	Ile	Ala	Ala	Glu	Asp	Val	Leu	His	Asp	Ile
			340					345					350		
Gly	Val	Ile	Ala	Met	Thr	Ser	Ser	Asp	Ser	Gln	Ala	Met	Gly	Arg	Ala
		355					360					365			
Gly	Glu	Val	Ile	Pro	Arg	Thr	Trp	Gln	Thr	Ala	Asp	Lys	Asn	Lys	Lys
	370					375					380				
Glu	Phe	Gly	Lys	Leu	Pro	Glu	Asp	Ser	Ala	Asp	Asn	Asp	Asn	Phe	Arg
385					390					395					400
Ile	Lys	Arg	Tyr	Ile	Ser	Lys	Tyr	Thr	Ile	Asn	Pro	Ala	Leu	Thr	His
				405					410					415	
Gly	Val	Ser	Glu	Tyr	Ile	Gly	Ser	Val	Glu	Glu	Gly	Lys	Ile	Ala	Asp
			420					425					430		
Leu	Val	Val	Trp	Asn	Pro	Ala	Phe	Phe	Gly	Val	Lys	Pro	Lys	Ile	Val
		435					440					445			
Ile	Lys	Gly	Gly	Met	Val	Val	Phe	Ser	Glu	Met	Gly	Asp	Ser	Asn	Ala
	450					455					460				
Ser	Val	Pro	Thr	Pro	Gln	Pro	Val	Tyr	Tyr	Arg	Glu	Met	Phe	Gly	His
465					470					475					480
His	Gly	Lys	Ala	Lys	Phe	Asp	Thr	Ser	Ile	Thr	Phe	Val	Ser	Lys	Val
				485					490					495	
Ala	Tyr	Glu	Asn	Gly	Val	Lys	Glu	Lys	Leu	Gly	Leu	Glu	Arg	Lys	Val
			500					505					510		
Leu	Pro	Val	Lys	Asn	Cys	Arg	Asn	Ile	Thr	Lys	Lys	Asp	Phe	Lys	Phe
		515					520					525			

Glu	Ala	Thr	Phe	Pro	Asp	Gly	Thr	Lys	Leu	Val	Thr	Val	Asn	Trp	Pro		
85						90					95						
atc	gaa	cct	gat	gaa	cac	ttt	aag	gcg	ggg	gaa	gtg	aaa	ttt	ggc	tgt	392	
Ile	Glu	Pro	Asp	Glu	His	Phe	Lys	Ala	Gly	Glu	Val	Lys	Phe	Gly	Cys		
100					105					110				115			
gat	aaa	gac	att	gaa	ctc	aac	gca	ggg	aag	gaa	gtt	acc	gaa	cta	gaa	440	
Asp	Lys	Asp	Ile	Glu	Leu	Asn	Ala	Gly	Lys	Glu	Val	Thr	Glu	Leu	Glu		
				120				125					130				
gtt	act	aac	gaa	gga	cct	aaa	tcc	ttg	cat	gtg	ggg	agc	cat	ttc	cac	488	
Val	Thr	Asn	Glu	Gly	Pro	Lys	Ser	Leu	His	Val	Gly	Ser	His	Phe	His		
		135					140					145					
ttc	ttt	gaa	gcc	aac	aaa	gca	ttg	aaa	ttc	gat	cgg	gaa	aaa	gcc	tat	536	
Phe	Phe	Glu	Ala	Asn	Lys	Ala	Leu	Lys	Phe	Asp	Arg	Glu	Lys	Ala	Tyr		
	150					155				160							
ggc	aaa	cgc	cta	gat	att	ccc	tct	ggc	aac	aca	cta	cgc	att	ggg	gca	584	
Gly	Lys	Arg	Leu	Asp	Ile	Pro	Ser	Gly	Asn	Thr	Leu	Arg	Ile	Gly	Ala		
165					170					175							
gga	caa	acc	cgt	aaa	gtg	cag	tta	atc	cct	ctt	ggc	ggg	agt	aaa	aaa	632	
Gly	Gln	Thr	Arg	Lys	Val	Gln	Leu	Ile	Pro	Leu	Gly	Gly	Ser	Lys	Lys		
180				185				190					195				
gtg	att	ggc	atg	aac	ggg	ctt	gtg	aat	aat	att	gcg	gac	gaa	cgc	cat	680	
Val	Ile	Gly	Met	Asn	Gly	Leu	Val	Asn	Asn	Ile	Ala	Asp	Glu	Arg	His		
				200				205					210				
aaa	cac	aaa	gcg	cta	gac	aaa	gca	aaa	tct	cac	gga	ttt	atc	aag	taa	728	
Lys	His	Lys	Ala	Leu	Asp	Lys	Ala	Lys	Ser	His	Gly	Phe	Ile	Lys			
		215				220					225						
ggagactccc	atg	aaa	atg	aaa	aaa	caa	gag	tat	gta	aat	acc	tac	gga			777	
	Met	Lys	Met	Lys	Lys	Gln	Glu	Tyr	Val	Asn	Thr	Tyr	Gly				
		230				235						240					
ccc	acc	aca	ggc	gat	aaa	gtg	cgc	tta	gga	gat	acc	gat	ctt	tgg	gca	825	
Pro	Thr	Thr	Gly	Asp	Lys	Val	Arg	Leu	Gly	Asp	Thr	Asp	Leu	Trp	Ala		
			245			250						255					
gaa	gta	gaa	cat	gac	tat	acc	acc	tat	ggc	gaa	gaa	ctc	aaa	ttc	ggg	873	
Glu	Val	Glu	His	Asp	Tyr	Thr	Thr	Tyr	Gly	Glu	Glu	Leu	Lys	Phe	Gly		
		260				265						270					
gca	ggg	aaa	act	atc	cgt	gag	ggg	atg	ggg	cag	agc	aat	agc	cca	gat	921	

Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp	
275	280 285
gaa aac acc tta gat tta gtg atc acc aac gcg atg att att gac tac	969
Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr	
290	295 300
acc ggg att tac aaa gcc gac att ggc att aaa aat ggc aaa atc cat	1017
Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His	
305	310 315 320
ggc att ggc aag gca gga aac aag gac atg caa gat ggc gta agc cct	1065
Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro	
	325 330 335
cat atg gtc gtg ggt gtg ggc aca gaa gca cta gca ggg gaa ggt atg	1113
His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met	
	340 345 350
att att acc gct ggg ggg atc gat tca cac acc cac ttc ctc tct cca	1161
Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro	
	355 360 365
caa caa ttc cct acc gct cta gcc aat ggc gtt aca aca atg ttt ggc	1209
Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly	
	370 375 380
ggc ggc aca ggc ccc gta gat ggc acg aat gcg act acc atc act ccg	1257
Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro	
385	390 395 400
ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gca gaa gag tat tct	1305
Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser	
	405 410 415
atg aat gtg ggc ttt ttg ggc aaa ggc aat agc tct agt aaa aaa caa	1353
Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln	
	420 425 430
ctt gta gaa caa gta gaa gcg ggc gcg att ggt ttt aaa ttg cat gaa	1401
Leu Val Glu Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu	
	435 440 445
gac tgg ggc aca act cca agt gcg atc gat cac tgc ttg agc gta gca	1449
Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala	
450	455 460
gat gaa tac gat gtg caa gtt tgt ata cac acc gat acg gtc aat gag	1497

Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro	
660	665 670
aaa atc gtg atc aaa ggc ggt atg gtg gtg ttc tct gaa atg ggc gat	2121
Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp	
675	680 685
tct aat gcg tct gtg ccc act cct cag ccg gtt tat tac cgc gaa atg	2169
Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met	
690	695 700
ttt ggg cat cac ggc aag gcg aaa ttt gac acc agc atc act ttt gtt	2217
Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val	
705	710 715 720
tcc aaa gtc gcc tat gaa aat ggt gtg aaa gaa aaa cta ggt tta gag	2265
Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu	
725	730 735
cgc aag gtg ctc ccc gtg aaa aac tgc cgt aac atc acc aag aag gac	2313
Arg Lys Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp	
740	745 750
ttc aag ttc aac gac aaa act gca aaa atc acc gtc gat ccg aaa acc	2361
Phe Lys Phe Asn Asp Lys Thr Ala Lys Ile Thr Val Asp Pro Lys Thr	
755	760 765
ttc gag gtc ttt gta gat ggc aaa ctc tgc acc tct aaa ccc acc tct	2409
Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Thr Ser	
770	775 780
gaa gtg cct cta gcc caa cgc tac act ttc ttc tag gcataat	2452
Glu Val Pro Leu Ala Gln Arg Tyr Thr Phe Phe	
785	790 795

<210> 14
 <211> 226
 <212> PRT
 <213> Helicobacter felis

<400> 14
 Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala
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 Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln
 20 25 30
 Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg
 35 40 45

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe
 50 55 60
 Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp
 65 70 75 80
 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val
 85 90 95
 Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys
 100 105 110
 Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr
 115 120 125
 Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser
 130 135 140
 His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu
 145 150 155 160
 Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg
 165 170 175
 Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly
 180 185 190
 Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp
 195 200 205
 Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe
 210 215 220
 Ile Lys
 225

<210> 15

<211> 568

<212> PRT

<213> *Helicobacter felis*

<400> 15

Met Lys Met Lys Lys Gln Glu Tyr Val Asn Thr Tyr Gly Pro Thr Thr
 1 5 10 15
 Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu
 20 25 30
 His Asp Tyr Thr Thr Tyr Gly Glu Leu Lys Phe Gly Ala Gly Lys
 35 40 45
 Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr
 50 55 60
 Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile
 65 70 75 80
 Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly
 85 90 95
 Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val
 100 105 110
 Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr
 115 120 125

Ala	Gly	Gly	Ile	Asp	Ser	His	Thr	His	Phe	Leu	Ser	Pro	Gln	Gln	Phe	130	135	140
Pro	Thr	Ala	Leu	Ala	Asn	Gly	Val	Thr	Thr	Met	Phe	Gly	Gly	Gly	Thr	145	150	155
Gly	Pro	Val	Asp	Gly	Thr	Asn	Ala	Thr	Thr	Ile	Thr	Pro	Gly	Lys	Trp	165	170	175
Asn	Leu	His	Arg	Met	Leu	Arg	Ala	Ala	Glu	Glu	Tyr	Ser	Met	Asn	Val	180	185	190
Gly	Phe	Leu	Gly	Lys	Gly	Asn	Ser	Ser	Ser	Lys	Lys	Gln	Leu	Val	Glu	195	200	205
Gln	Val	Glu	Ala	Gly	Ala	Ile	Gly	Phe	Lys	Leu	His	Glu	Asp	Trp	Gly	210	215	220
Thr	Thr	Pro	Ser	Ala	Ile	Asp	His	Cys	Leu	Ser	Val	Ala	Asp	Glu	Tyr	225	230	235
Asp	Val	Gln	Val	Cys	Ile	His	Thr	Asp	Thr	Val	Asn	Glu	Ala	Gly	Tyr	245	250	255
Val	Asp	Asp	Thr	Leu	Asn	Ala	Met	Asn	Gly	Arg	Ala	Ile	His	Ala	Tyr	260	265	270
His	Ile	Glu	Gly	Ala	Gly	Gly	Gly	His	Ser	Pro	Asp	Val	Ile	Thr	Met	275	280	285
Ala	Gly	Glu	Val	Asn	Ile	Leu	Pro	Ser	Ser	Thr	Thr	Pro	Thr	Ile	Pro	290	295	300
Tyr	Thr	Ile	Asn	Thr	Val	Ala	Glu	His	Leu	Asp	Met	Leu	Met	Thr	Cys	305	310	315
His	His	Leu	Asp	Lys	Arg	Ile	Arg	Glu	Asp	Leu	Gln	Phe	Ser	Gln	Ser	325	330	335
Arg	Ile	Arg	Pro	Gly	Ser	Ile	Ala	Ala	Glu	Asp	Val	Leu	His	Asp	Ile	340	345	350
Gly	Val	Ile	Ala	Met	Thr	Ser	Ser	Asp	Ser	Gln	Ala	Met	Gly	Arg	Ala	355	360	365
Gly	Glu	Val	Ile	Pro	Arg	Thr	Trp	Gln	Thr	Ala	Asp	Lys	Asn	Lys	Lys	370	375	380
Glu	Phe	Gly	Lys	Leu	Pro	Glu	Asp	Gly	Ala	Asp	Asn	Asp	Asn	Phe	Arg	385	390	395
Ile	Lys	Arg	Tyr	Ile	Ser	Lys	Tyr	Thr	Ile	Asn	Pro	Ala	Leu	Thr	His	405	410	415
Gly	Val	Ser	Glu	Tyr	Ile	Gly	Ser	Val	Glu	Glu	Gly	Lys	Ile	Ala	Asp	420	425	430
Leu	Val	Val	Trp	Asn	Pro	Ala	Phe	Phe	Gly	Val	Lys	Pro	Lys	Ile	Val	435	440	445
Ile	Lys	Gly	Gly	Met	Val	Val	Phe	Ser	Glu	Met	Gly	Asp	Ser	Asn	Ala	450	455	460
Ser	Val	Pro	Thr	Pro	Gln	Pro	Val	Tyr	Tyr	Arg	Glu	Met	Phe	Gly	His	465	470	475
His	Gly	Lys	Ala	Lys	Phe	Asp	Thr	Ser	Ile	Thr	Phe	Val	Ser	Lys	Val	485	490	495
Ala	Tyr	Glu	Asn	Gly	Val	Lys	Glu	Lys	Leu	Gly	Leu	Glu	Arg	Lys	Val	500	505	510

Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe
 515 520 525
 Asn Asp Lys Thr Ala Lys Ile Thr Val Asp Pro Lys Thr Phe Glu Val
 530 535 540
 Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Thr Ser Glu Val Pro
 545 550 555 560
 Leu Ala Gln Arg Tyr Thr Phe Phe
 565

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 <212> DNA
 <213> Helicobacter felis

<400> 16
 catgcacttt ttgaaaaaag a 21

<210> 17
 <211> 16
 <212> DNA
 <213> Helicobacter felis

<400> 17
 tatggtggtc ttctct 16

<210> 18
 <211> 32
 <212> DNA
 <213> Helicobacter felis

<400> 18
 ggagtaacat atgaaactca cacccaaaga gc 32

<210> 19
 <211> 27
 <212> DNA
 <213> Helicobacter felis

<400> 19
 cacacccacg accatgtgag ggcttac 27

<210> 20

<211> 27
<212> DNA
<213> Helicobacter felis

<400> 20
gtaagccctc acatggtcgt ggggtgtg 27

<210> 21
<211> 34
<212> DNA
<213> Helicobacter felis

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cgaattcgga tcctagaaga aagtgtagcg ctgg 34